(51) International Patent Classification 6 : **F16D 41/20, 7/02, F02B 67/06**	**A1**	(11) International Publication Number: **WO 98/50709** (43) International Publication Date: 12 November 1998 (12.11.98)

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(54) Title: SERPENTINE DRIVE SYSTEM WITH IMPROVED OVER-RUNNING ALTERNATOR DECOUPLER

(57) Abstract

A serpentine belt drive system (18) for an automotive vehicle comprising a drive assembly including an internal combustion engine (10) having an output shaft (14) with a driving pulley (16) thereon rotable about a driving pulley axis. A sequence of driven assemblies each has a driven pulley rotable about an axis parallel with the driving pulley axis and a serpentine belt (20) mounted in cooperating relation with the driving pulley (16) and with the driven pulleys in a sequence which corresponds with the sequence of the driven assemblies when related to the direction of movement of the belt to cause said driven pulleys to rotate in response to the rotation of the driving pulley. The sequence of driven assemblies includes an alternator assembly (26) including an alternator shaft (36) mounted for rotation about a shaft axis. A hub strucure (52) is fixedly carried by the alternator shaft (36) for rotation therewith about the shaft axis. A spring and one-way clutch mechanism couples the alternator pulley (26) with the hub structure (52). The spring and one-way clutch mechanism (72) comprises a resilient spring member (74) separately formed from and connected in series with a one-way clutch member (76). The resilient spring member (74) is constructed and arranged to transmit the driven rotational movements of the alternator pulley (26) by the serpentine belt (20) to the hub structure (52) such that the alternator shaft (36) is rotated in the same direction as the alternator pulley (26) while being capable of instantaneous relative resilient movements in opposite directions with respect to the alternator pulley during the driven rotational movement thereof. The one-way clutch member (76) is constructed and arranged to allow the hub structure and hence the alternator shaft to rotate at a speed in excess of the rotational speed of the alternator pulley when the speed of the engine output shaft is decelerated to an extend sufficient to establish the torque between the alternator pulley (26) and the hub structure (52) at the predetermined negative level.